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10/553,956	10/19/2005	Hideichi Sasaoka	070456-0090	9982

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EXAMINER
KING, JOHN B

ART UNIT	PAPER NUMBER
2435	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on *17 December 2008*.

2a) ☒ This action is **FINAL**.   2b) ☐ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) *1-12* is/are pending in the application.

   4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) *1-12* is/are rejected.

7) ☐ Claim(s) _____ is/are objected to.

8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.

   Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

   Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

   a) ☒ All   b) ☐ Some *   c) ☐ None of:

   1. ☐ Certified copies of the priority documents have been received.

   2. ☐ Certified copies of the priority documents have been received in Application No. _____.

   3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

   * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
   Paper No(s)/Mail Date *9-24-2008*.

4) ☐ Interview Summary (PTO-413)
   Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1.   This office action is in response to applicant's amendment filed on December 17, 2008.

2.   Claims 1-12 are pending in this application. Claims 2 and 10-12 are amended by applicant's amendment.

3.   Applicant's arguments in respect to the new issues of claims 1-12 have been considered but they are not persuasive.

Response to Arguments

4.   The amendment to the claim 10 is accepted as overcoming the rejections under 35 U.S.C. 112, second paragraph of the first Office Action, mailed September 17, 2008. However, the amendments to claims 1, 2, and 5 do not overcome the rejections and therefore the rejections still stand. The limitation of "strength profile of a plurality of radio waves" is unclear and can be understood to cover any type of strength between radio waves, such as the interference strength between waves.

5.   Applicant's arguments filed December 17, 2008 have been fully considered but they are not persuasive. In the remarks applicant argues:

I)   Takatori does not teach generating a strength profile based upon the changing directivities with prescribed patterns.

II)   Takatori does not teach the weight vector corresponding to the strength profile.

III)   Takatori in view of White does not teach generating a first private key based upon the generated first receive signal profile.

In response to applicant's arguments:

I)   The examiner respectfully disagrees that Takatori does not teach the above limitation. Although Takatori does not specifically state changing the directivities with prescribed patterns, it does state changing the directivity based upon a weight vector. The weight vector is based on the signal interference [strength profile of a plurality of radio waves]. As the signal interference changes, the weight vector and thus the directivity will change. Different interferences will result in different weight vectors and different directivities. Based upon the applicant's claim language with regards to the use of comprising in the preamble and the use of while in the claim, the claim limitations may be rejected in any order. Therefore, Takatori teaches the required limitations.

II)   The examiner respectfully disagrees that Takatori does not teach the above limitation. Takatori, paragraph 157, does teach that the weight vector is based upon a strength profile. The strength that the profile is based upon is the strength of the interference between the signals.

III)   The examiner respectfully disagrees that Takatori in view of White does not teach the above limitation. Takatori teaches monitoring the radio waves and generating a weight vector based upon the interference between the signals and then does something based upon the weight vector. This weight vector can be considered as data stored in some memory that is accessible to the system. White uses a lookup table, which is data stored in memory, and uses that to generate cryptographic keys. Therefore, it would be obvious for White's invention to use the weight vector that is stored in memory to generate the keys instead of using a lookup table.

Examiner Notes

6.   Examiner cites particular columns and line numbers in the references as applied to the claims below for the convenience of the applicant. Although the specified citations are representative of the teachings in the art and are applied to the specific limitations within the individual claim, other passages and figures may apply as well. It is respectfully requested that, in preparing responses, the applicant fully consider the references in entirety as potentially teaching all or part of the claimed invention, as well as the context of the passage as taught by the prior art or disclosed by the examiner.

Claim Rejections - 35 USC § 112

7.   The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

8.   **Claims 1, 2, and 5** are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

9.   As per **claim 1, 2, and 5**, the limitation "strength profile of a plurality of radio waves" is too broad and makes the claims unclear. The examiner believes that the applicant used the term "strength" to mean "signal strength", but the strength of a signal can be interpreted to include many different things, such as the strength of the interference between the signals.

10.   The examiner has cited particular examples of 35 U.S.C. 112 rejections above. It is

respectfully requested that, in preparing responses, the applicant check the claims for further 35

U.S.C. 112 rejections as being indefinite in case it was inadvertently missed by the examiner.

The following prior art rejections are based upon the examiner's best interpretation of the

claims.

Claim Rejections - 35 USC § 103

11.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness

rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth
> in section 102 of this title, if the differences between the subject matter sought to be patented and the prior
> art are such that the subject matter as a whole would have been obvious at the time the invention was
> made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall
> not be negatived by the manner in which the invention was made.

12.   **Claims 1-10** are rejected under 35 U.S.C. 103(a) as being unpatentable over Takatori et

al. (US 2002/0111191 A1) published August 15, 2002, hereinafter referred to as Takatori, in

view of White et al. (US Patent No. 5513263) published April 30, 1996, hereinafter referred to as

White.

As per **claim 1**, Takatori discloses a radio communications system comprising: a first

antenna having a directivity electrically switchable; a second antenna; and first and second radio

devices [base stations] mutually transmitting and receiving a radio wave through a radio

transmission path via said first and second antennas, wherein: said first radio device receives a

radio wave or waves from said second radio device while changing a directivity of said first

antenna with prescribed patterns to form a plurality of directivities, generates a first receive

signal profile [weight vector] indicative of a strength profile of a plurality of radio waves received

with the respective ones of the directivities; and said second radio device receives a radio wave

or waves from said first radio device while changing a directivity of said first antenna with

prescribed patterns to form a plurality of directivities, generates a second receive signal profile

indicative of a strength profile of a plurality of radio waves received with the respective ones of

the directivities (paragraph 157, Takatori teaches a plurality of base stations where each base

station has an antenna that can change the directivity characteristics. Takatori also discloses

that the base stations can receive and transmit "radio wave signals" to the other base stations

through the many terminal stations (transmission path). Takatori also teaches creating a weight

vector based upon the interference power of the signals and changing the directivities of the

antennae based upon the weight vector. Takatori teaches the above function of changing the

directivity based upon a weight vector for multiple antennae which covers the limitation of a first

and second radio device.)

However, Takatori does not teach generating a key based upon the signal profile [weight

vectors].

White discloses generating a first key and then generating a second key by using a

lookup table where the first and second keys should be the same (Figures 4, 6, 7, and 9, White

teaches generating two keys in different ways where the two keys should be the same.)

Takatori and White are analogous art because they are from the same field of endeavor

of using encryption to perform secure communications.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the antenna control system as taught by Takatori by adding the key generation and encryption as taught by White because it would allow for more secure communication between the radios (key generation is more secure that storing the keys and randomly choosing one).

As per **claim 2**, Takatori in view of White discloses the radio communications system of claim 1 [See rejection to claim 1 above] , wherein: said first and second receive signal profiles [weight vectors] are each formed of a plurality of strength of a plurality of radio waves corresponding to said plurality of directivities (Takatori paragraph 157 discloses generating weight vectors based upon signal strength and adjusts the directivities of the antennae accordingly.); and said first and second radio devices quantize said plurality of strength to generate said first and second private keys (Takatori (paragraph 157) teaches generating a weight vector from the strength of the interference of a signal. White (figures 4, 6, 7, and 9) teaches generating two keys in different ways where the two keys that are generated are the same).

As per **claim 3**, Takatori in view of White disclose the radio communications system of claim 1 [See rejection to claim 1 above], wherein said first and second radio devices transmit and receive said plurality of radio waves in a time division duplex system (Takatori, paragraph 157, teaches multiple base stations and terminal stations communicating with each other using the same communication channel, frequency, and timing. This can be considered a Time Division Duplex system).

As per **claim 4**, Takatori in view of White disclose the radio communications system of claim 1 [See rejection to claim 1 above], wherein said first radio device verifies that said first

private key generated matches said second private key (White (figures 4, 6, 7, and 9) teaches generating keys (passwords) and verifying that the keys match).

As per **claim 5**, Takatori discloses a radio communications system comprising: a first antenna having a directivity electrically switchable; a second antenna; and first and second radio devices mutually transmitting and receiving a radio wave through a radio transmission path via said first and second antennas wherein: said first radio device receives a radio wave or waves corresponding to a plurality of data transmitted by said second radio device in accordance with a prescribed communications protocol while changing a directivity of said first antenna with prescribed patterns to form a plurality of directivities, generates a first receive signal profile indicative of a strength profile of a plurality of radio waves received with the respective ones of the directivities; and said second radio device receives a radio wave or waves corresponding to a plurality of data transmitted by said first radio device in accordance with a prescribed communications protocol while changing a directivity of said first antenna with prescribed patterns to form a plurality of directivities, generates a second receive signal profile indicative of a strength profile of a plurality of radio waves received with the respective ones of the directivities (paragraph 157, Takatori teaches a plurality of base stations where each base station has an antenna that can change the directivity characteristics. Takatori also discloses that the base stations can receive and transmit "radio wave signals" to the other base stations through the many terminal stations (transmission path). Takatori also teaches creating a weight vector based upon the interference of the signals and changing the directivities of the antennae based upon the weight vector. Takatori teaches the above function of changing the directivity based upon a weight vector for multiple antennae which covers the limitation of using a first and

second radio device. Takatori also discloses a communications protocol. The method of sending

data from one radio to another always going through a terminal station can be considered as a

communications protocol).

However, Takatori does not teach generating a key based upon the signal profile [weight

vectors].

White discloses generating a first key and then generating a second key by using a

lookup table where the first and second keys should be the same (Figures 4, 6, 7, and 9, White

teaches generating two keys in different ways where the two keys should be the same).

Takatori in view of White are analogous art because they are from the same field of

endeavor of using encryption to perform secure communications.

It would have been obvious to one of ordinary skill in the art at the time of the invention to

modify the antenna control system as taught by Takatori by adding the key generation and

encryption as taught by White because it would allow for more secure communication between

the radios (key generation is more secure that storing the keys and randomly choosing one).

As per **claim 6**, Takatori in view of White disclose the radio communications system of

claim 5 [See rejection to claim 5 above], wherein when said first radio device [base station] has

said first antenna controlled to be omnidirectional (Takatori, paragraph 66, discloses that the

antennae are omnidirectional), said first radio device establishes said radio transmission path

[communication channel] between said first radio device and said second radio device and

thereafter said first radio device has said first antenna changing the directivity to form said

plurality of directivities, while said first radio device communicates said plurality of data with said

second radio device (Takatori, paragraph 157, discloses base stations communicating with each

other in order to transmit data. Takatori also discloses changing the directivity of the antennae to achieve a stronger signal).

As per **claim 7**, Takatori in view of White disclose the radio communications system of claim 6 [See rejection to claim 6 above], wherein when said first radio device communicates each of said data with said second radio device, said first radio device updates a directivity of said first antenna to receive said data from said second radio device and maintains said updated directivity of said first antenna to transmit said received data to said second radio device (Takatori, paragraph 157, discloses bases stations communicating with each other to transmit data. Takatori also teaches changing the directivity of the antennae to achieve a stronger signal).

As per **claim 8**, Takatori in view of White disclose the radio communications system of claim 6 [See rejection to claim 6 above], wherein: said prescribed communications protocol is formed of a plurality of hierarchical layers; said plurality of data are included in a data format in a hierarchical layer of said plurality of hierarchical layers converting said data to said electrical signal; and said hierarchical layer converting said data to said electrical signal is common to a plurality of communications protocols (White, col. 1 lines 28-48, discloses transferring data using wireless LAN. Wireless LAN uses the TCP/IP protocol which is a communications protocol that uses hierarchical layers to transmit data packets).

As per **claim 9**, Takatori in view of White disclose the radio communications system of claim 5 [See rejection to claim 5 above], wherein said plurality of data are each formed of a section detecting a strength of a radio wave received from said first and second radio devices and a section changing the directivity of said first antenna (Takatori, paragraph 157, discloses

generating a weight vector based upon the strength of the signal interference and transferring

that weight vector to the base station as a control signal (data) so that the base stations can

change the directivity of the antenna to achieve a stronger signal).

As per **claim 10**, Takatori in view of White disclose the radio communications system of

any one of claims 1-3 or 5-9 [See rejections to claims 1-3 or 5-9 above], wherein when said first

private key generated does not match said second private key, said first radio device matches

said first private key to said second private key (As in claim 4 above, White (figures 4, 6, 7, and

9) teaches generating keys (passwords) and verifying that the keys match. It would be obvious

to one of ordinary skill in the art to check again to make sure that the keys match before

continuing with the communication with the other antenna).

13.   **Claims 11 and 12** are rejected under 35 U.S.C. 103(a) as being unpatentable over

Takatori et al. (US 2002/0111191 A1) published August 15, 2002, hereinafter referred to as

Takatori, in view of White et al. (US Patent No. 5513263) published April 30, 1996, hereinafter

referred to as White, and further in view of Barrett et al (US Patent No. 5222137) published June

22, 1993, hereinafter referred to as Barrett.

As per **claim 11**, Takatori in view of White disclose the radio communications system of

any one of claims 1-9 [See rejections to claims 1-9 above].

However, Takatori in view of White does not teach having a first antenna provided for

said first radio device arranged adjacent to a terminal of an eavesdropper.

Barrett, col. 1 lines 11-30, discloses that one reason for securing data communications is because of eavesdroppers.

Takatori in view of White and Barrett are analogous art because they are from the same field of endeavor of using encryption to secure data communications.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the antenna control system with encryption as taught by Takatori in view of White by adding the secure data communications as taught by Barrett in order to reduce the risk of theft of data by eavesdroppers.

As per **claim 12**, Takatori in view of White and further in view of Barrett disclose the radio communications system of any one of claims 1-9 [See rejections to claims 1-9 above], wherein said first and second radio devices employ said first and second private keys to encrypt and decrypt data, and communicate said data (Barrett, col. 1 lines 58-68 and col. 2 lines 1-16, discloses encrypting data using a key and also transmitting that data which can later be decrypted by another user).

Conclusion

14.   Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the

THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

15.   Any inquiry concerning this communication or earlier communications from the examiner should be directed to John B. King whose telephone number is (571)270-7310. The examiner can normally be reached on Mon. - Fri. 7:30 AM - 4:00 PM est..

    If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kim Vu can be reached on (571)272-3859. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

    Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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